

Notice of Allowability

Application No.

10/700,525

Examiner

Bernard E. Souw

Applicant(s)

FURIKI ET AL.

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment 12/14/2005.
2. ☒ The allowed claim(s) is/are 3-7 and 9.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this Examiner's Amendment has been given during a phone conversation with applicant's attorney, Mr. Mark J. Thronson, Reg. No. 33,082, on February 27, 2006.

In the claims:

► In claim 4, line 14, after "*charged particle beam is irradiated*", prior to "*so as to cause*", insert -- ***onto the circuit pattern including the defect or the foreign-particle such that a temperature of the circuit pattern is kept at a temperature higher than the environmental temperature --***

► In claim 5, line 3, after "*a specified portion*", prior to "*and the charging*", insert -- ***including the defect or the foreign-particle in a circuit such that a temperature of the portion is kept at a temperature higher than the environmental temperature --***.

► In claim 6, line 4, after "*a specified portion*", prior to "*so as to cause*", insert -- ***including a defect or a foreign-particle such that a temperature of the portion is kept at a temperature higher than the environmental temperature --***.

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► In claim 7, in the last line, after "*the formed mark*", prior to ".", insert -- , ***and wherein the charged particle beam is irradiated onto a portion including the defect or the foreign-particle such that a temperature of the portion is kept at a temperature higher than the environmental temperature --.***

► In claim 9, in the last line, after "*the charged particle beam*", prior to ".", insert -- , ***and wherein the charged particle beam is irradiated onto a portion including the defect or the foreign-particle such that a temperature of the portion is kept at a temperature higher than the environmental temperature --.***

Examiner-Initiated Interview

2. An Examiner-initiated telephone interview with the Applicant's Attorney, Mr. Mark J. Thronson, has been conducted on February 13, 2006, to discuss a possible examiner's amendment as a condition for allowance. Agreement was achieved on February 27, 2006 and confirmed by a facsimile transmission received on 03/01/2006. See Examiner's amendment.

Applicant's Amendment

3. The Amendment filed 12/14/2005 in response to the Non-Final Office Action dated 06/14/2005 has been entered. The present Office Action is made with all the arguments being fully considered.

The specification has been amended.

Claims 1 and 2 have been cancelled.

Claim 8 has been previously cancelled.

Claims 3-7 and 9 remain pending in this office action.

ALLOWANCE

4. Claims 3-7 and 9 are allowed.

The claims are subsequently renumbered to claims 1-6.

Reasons for Allowance

5. The following is an examiner's statement of reasons for allowance:

► A circuit pattern inspection apparatus (CPIA) that irradiates a charged particle beam (CPB) on a plurality of areas of a circuit pattern, detects secondary charged particles generated from the circuit pattern to form an image of the irradiated areas, and compares the images of the plurality of areas to thereby detect a defect or a foreign-particle in the circuit, wherein a mark that can be used for specifying the defect or foreign particle in the circuit is formed in the form of charging by means of CPB irradiation, and wherein the CPB is irradiated onto a portion including the defect or the foreign-particle in the circuit such that a temperature of the portion is kept at a temperature higher than the environmental temperature, as recited in claim 9, is neither anticipated nor rendered obvious by any prior art.

► A charged particle beam apparatus system (CPBS), comprising a circuit pattern inspection apparatus (CPIA) as recited in claim 9, and a CPB apparatus (CPBA) that is used for observation or analysis of the defect specified by means of the pattern

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inspection apparatus, wherein charging is formed by means of irradiation of the CPB, or a carbon-base deposit is formed on the irradiated area as the result of interaction between the CPB and gas that is remaining in the circuit pattern inspection apparatus or generated from the sample, and the charging or deposit is used as a mark in the CPB apparatus, wherein a mechanism for spraying gas onto the circuit pattern is provided in the CPIA, wherein the CPB is irradiated onto a portion including the defect or the foreign-particle in the circuit such that a temperature of the portion is kept at a temperature higher than the environmental temperature, as recited in claim 3, 4, and 7, and further, wherein a cooling unit for cooling the circuit pattern is provided, as additionally recited in claim 3, or wherein the field of view is matched for forming an image of the defect or the area including foreign-particle in the apparatus based on the formed mark, as additionally recited in claim 7, is neither anticipated nor rendered obvious by any prior art.

► Claim 5 is allowed for reciting a method for forming an image in which a CPB is scanned on a sample to form an image of the scanned area, wherein the CPB is irradiated selectively onto a specified portion including a defect or a foreign-particle in a circuit such that a temperature of the portion is kept at a temperature higher than the environmental temperature and the charging formed by the irradiation is used as a mark in the image so as to cause charging on the specified portion that is different from charging of the scanned area other than the specified portion, as recited in claim 5, is neither anticipated nor rendered obvious by any prior art.

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► Claim 6 is allowed for reciting an inspection method in which a CPB is scanned onto a semiconductor device in a first CPB apparatus (CPBA) to form an image of the scanned area, wherein the CPB is irradiated selectively onto a specified portion including a defect or a foreign-particle in a circuit such that a temperature of the portion is kept at a temperature higher than the environmental temperature so as to cause charging on the specified portion, the semiconductor device then transferred to a second CPBA while keeping the charging condition, and the CPB being irradiated onto the portion to be inspected that is specified by the charging for inspection of the portion..

6. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Relevant Prior Art

7. This prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

(a) USPAT 6,388,747, issued to Nara et al., USPGPUB 2002/0028399 issued to Nakasuji et al., USPGPUB 2005/0121611 and USPAT 6,855,929, both issued to Kimba et al., all four references disclose a CPB inspection apparatus that detects defects or foreign particles by their charging effects. However, none of them teaches to use

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carbon deposit to mark the defects or foreign articles. Nara even teaches away from depositing carbon by avoiding prolonged CPB irradiation.

(b) USPAT 6,566,654 issued to Funatsu et al. also disclose a CPB inspection apparatus that detects defects or foreign particles by their charging effects. Funatsu et al. make use carbon deposit to mark the defects or foreign articles.

However, none of the prior art references cited above teaches to irradiate the CPB onto a selected portion such that a temperature of the portion is kept at a temperature higher than the environmental temperature, as recited in claims 3-7 and 9.

Communications

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard E Souw whose telephone number is 571 272 2482. The examiner can normally be reached on Monday thru Friday, 9:00 am to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 571 272 2477. The central fax phone number for the organization where this application or proceeding is assigned is 571 273 8300 for regular communications as well as for After Final communications.

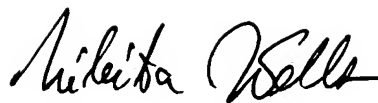
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571 272 5993.

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March 03, 2006



NIKITA WELLS
PRIMARY EXAMINER

03/06/06